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bably forbid the application of this test to the case of the Teay Valley. Can any other test be suggested?

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ZOOLOGICAL NOTES.

A MONOGRAPH OF CRINOIDS.*

THE crinoids of the Paleozoic rocks of North America are so rich and varied in form, so numerous in individuals, that they have long been the delight and the despair of naturalists. Especially is this the case with that order of the crinoids to which the name Camerata is now generally applied, the order that includes such well-known forms as the Nava Encrinite, *Actinocrinus*, and the Rose' Encrinite, *Rhodocrinus*, which are common enough in our own Mountain Limestone, together with the flatter and simpler form, *Platycrinus*. For, in America, there are added to these ordinary genera such remarkable creatures as the huge *Megistocrinus*; the speared and spined *Dorycrinus*; the peculiar mushroom-like *Agaricocrinus*; *Strotocrinus*, like a college don in his mortar-board; *Eretmocrinus*, with its broad oar-like arms; *Pterotocrinus*, whose lofty dome is surmounted by wings; *Gilbertocrinus*, with strange drooping appendages of unknown function, and *Batocrinus*, whose pores at the bases of the arms are equally mysterious. But this list does not include a quarter of the cameratae or vaulted genera known from the Carboniferous rocks of America alone; while, if we accept the the work of Mr. S. A. Miller and kindred spirits, the long line will stretch out to the crack of doom. Such, indeed, is the variety of form, and such the rashness of interpretation of some of the more enthusiastic collectors and describers, that to us European students the subject has become one of in-

extricable complexity. It is, therefore, with peculiar pleasure that we learn an authoritative monograph of these wonderful and beautiful beings is shortly to be issued.

Since the year 1859, or thereby, Charles Wachsmuth, who lives at Burlington, Iowa, in the very heart of the crinoid country, has devoted his life to the study of these animals. A large collection which he made was bought for the Museum at Cambridge, Mass., by Professor Louis Agassiz, at whose invitation Wachsmuth settled at the University to take charge of the whole collection of crinoids. The first-fruits of his study were published in 1877. After a time Wachsmuth returned to Burlington and began to form a second collection; much of this he was, unfortunately for himself, forced to part with, this time to the enrichment of the British Museum, in whose galleries some of his magnificent specimens are displayed. Association with Frank Springer enabled him to continue his collection and his studies, so that the series of fossil crinoide made by the two friends is unrivalled even by the great collections of London, Harvard or Stockholm, and their 'Revision of the Paleozoic Crinoids' has long held the front rank among all works on the subject. In their knowledge of the writings of others, in their accurate discrimination of generic and specific characters, and in their important contributions to the morphology of the crinoids, these gentlemen have shown themselves most fitted to prepare that desired necessity, a monograph of the fossil crinoids of North America. The magnitude of the task, the failing health of the elder worker and the business cares of the younger, have prevented the completion of more than a portion, that, namely, which deals with the Crinoidæ Camerata. The text of this portion alone will fill between 600 and 700 quarto pages, while no less than eighty-three plates, of extreme beauty, have been drawn by A. M. Westergren, J.

* Reprinted from proofs for *Natural Science* contributed by the Editor.

Ridgway and C. R. Keyes, under the immediate supervision of the authors. It is fitting that Professor Alexander Agassiz and the Museum of Comparative Zoölogy at Harvard should undertake the publication of this monograph. It will appear as one of the Memoirs of the Museum, so soon as the plates can be photographically reproduced from the original pencil drawings—that is, it is hoped, early in 1896. The price will be thirty dollars. As the edition will be limited, intending subscribers are requested to send their names to Professor Agassiz at the earliest possible date. A work of such usefulness and importance needs no recommendation from us; we can only hope that the enterprise of the publishers and the devotion of the workers may meet with due appreciation from the scientific public, and that Charles Wachsmuth and Frank Springer may be spared many years of health and leisure, to place the crown on this worthy monument of American paleontology.

THE FISHES OF THE COLORADO BASIN.

IN a paper on the 'Fishes of the Colorado Basin,' just published by the U. S. Fish Commission, Messrs. Evermann and Rutter have brought together all the published information accessible to them concerning the geographic distribution of the fishes of that river basin. Although the Colorado basin is one of the largest in the United States, the number of square miles drained being not less than 225,000, the number of species of fishes found in it is but 32. This number has been taken at a single haul with a 30-foot seine in Bean Blossom Creek, a little stream near Bloomington, Indiana.

The 32 species of the Colorado basin represent 5 families, as follows:

Catostomidae, or suckers, 8; *Cyprinidae*, or minnows, 19; *Salmonidae*, or trout and white-fish, 2; *Paciliidae*, or top-minnows, 2; and *Cottidae*, or blobs, 1.

The *Cyprinidae*, it will be noticed, constitute considerably more than half the entire fish-fauna.

Of the 18 genera represented, *Gila*, *Tiaroga*, *Meda*, *Plagopterus* and *Xyrauchen* are peculiar to that river basin, and a sixth genus, *Lepidomedra*, is known only from the Colorado and the Great Basin in southwestern Nevada, where it was discovered by the Death Valley expedition.

Of the 32 species all but 7 are thus far known only from this basin.

The extreme paucity of the fish-fauna of the Colorado basin will be apparent when it is recalled that 80 different species are known from the basin of the Rio Grande, 140 from that of the Missouri and 130 from the Wabash basin. Only 2 species (*Rhinichthys cataractae dulcis* and *Coltus bairdi punctulatus*) are found in both the Colorado and Missouri basins, only 2 species (*Agosia oscula* and *Agosia yarrowi*) are found in both the Colorado and the Rio Grande, while not a single species is common to both the Colorado and the Wabash basins.

The *Centrarchidae*, *Percidae* and *Siluridae* (sunfishes and basses, darters and catfish), which constitute such a large and important part of the fish-fauna east of the Rockies, have no representatives in the Colorado basin.

SKELETONS OF ZEUGLODON.

LAST November Mr. Charles Schuchert collected for the U. S. National Museum portions of two skeletons of Zeuglodon, and these are being used as the basis of a restoration of the entire skeleton for the Atlanta Exposition. Mr. Schuchert has devoted much time to 'developing' the material which promises to throw some needed light on certain portions of this interesting form. The radius and ulna, for example, are present and are more seal-like than cetacean. The hyoid suggests that of a Manatee, and the cervicals present a good

example of animal mechanics, being interlocked so as to be quite rigid. No traces of hind limbs have as yet come to light, but that section of the skeleton where they might have been was unfortunately defective. The material will be described at length in a Bulletin of the National Museum.

Apropos of *Zeuglodon* Mr. Schuchert characterizes the statement that their remains are so plentiful as to be used for building stone wall as a myth, but it will doubtless continue to live on in text-books in company with the figure of the pouched rat with everted pouches, which has held its place ever since the first description of the animal and seems likely to last indefinitely.

F. A. L.

SCIENTIFIC NOTES AND NEWS.

THE BOTANICAL SURVEY OF NEBRASKA.

In the *American Naturalist*, for June, Professor Charles E. Bessey gives an account of the 'Progress of the Botanical Survey of Nebraska.' The Survey, though a private enterprise, has received encouragement and support from the State Board of Agriculture, the State Horticultural Society and from the University of Nebraska, the work being in the hands of a 'Botanical Seminar' composed of Graduates of the University. The first important work issued by the Survey was H. J. Webber's 'Catalogue of the Flora of Nebraska,' published in 1890 in the Report of the State Board of Agriculture, and also issued as a separate Monograph. In it 1,890 species were enumerated, almost equally divided between flowering and non-flowering plants, nearly all of which were based on actual specimens in the possession of the author. Since this time the work has been steadily continued and the results have been published at frequent intervals, so that the list of known species now catalogued reaches about 3,050. Additional studies have been made in special directions on the distribution of

species. Of the 64 trees and 77 shrubs known to occur in the State the distribution is already well ascertained. The final Report of the survey is in preparation. It will be entitled the *Flora of Nebraska*, and will be issued in twenty-five parts of about 50 pages each. Part I. and part II. were issued in August, 1894 (reviewed in SCIENCE, Jan. 4, p. 25), and part XXII. *The Calyciflora* is now in press.

M. ANDRÉE'S POLAR EXPEDITION.

A COMMITTEE of the Paris Academy of Sciences, consisting of MM. Faye, Daubrée and Blanchard, have reported on the project of M. Andrée to explore the polar regions by balloon. They state that under the circumstances he is likely to reach the pole and will be able to solve many problems of scientific interest. But they fear that the return to inhabited regions will involve serious difficulties.

In the meanwhile M. Andrée is in Paris superintending the construction of a balloon. The balloon is to be of sufficient size to carry three persons, scientific instruments and provisions for four months and a boat transformable into a sledge, weighing in all about 3,000 kg. Gas under pressure in cylinders will be taken in order to refill the balloon from time to time—sufficient to keep the balloon in the air for thirty days.

M. Andrée expects to start from one of the Norwegian Islands of the Spitzbergen Archipelago situated to the extreme northwest of the mainland. July is fixed as the month of departure. A clear day will be chosen with a south wind. The balloon will travel at a minimum rate of 27 km. an hour, and M. Andrée hopes to reach the pole in a voyage of forty-three hours and to return safely to the inhabited regions of North America or Siberia.

According to an account in the *Revue Scientifique* by M. Ch. Rabot, the meteoro-